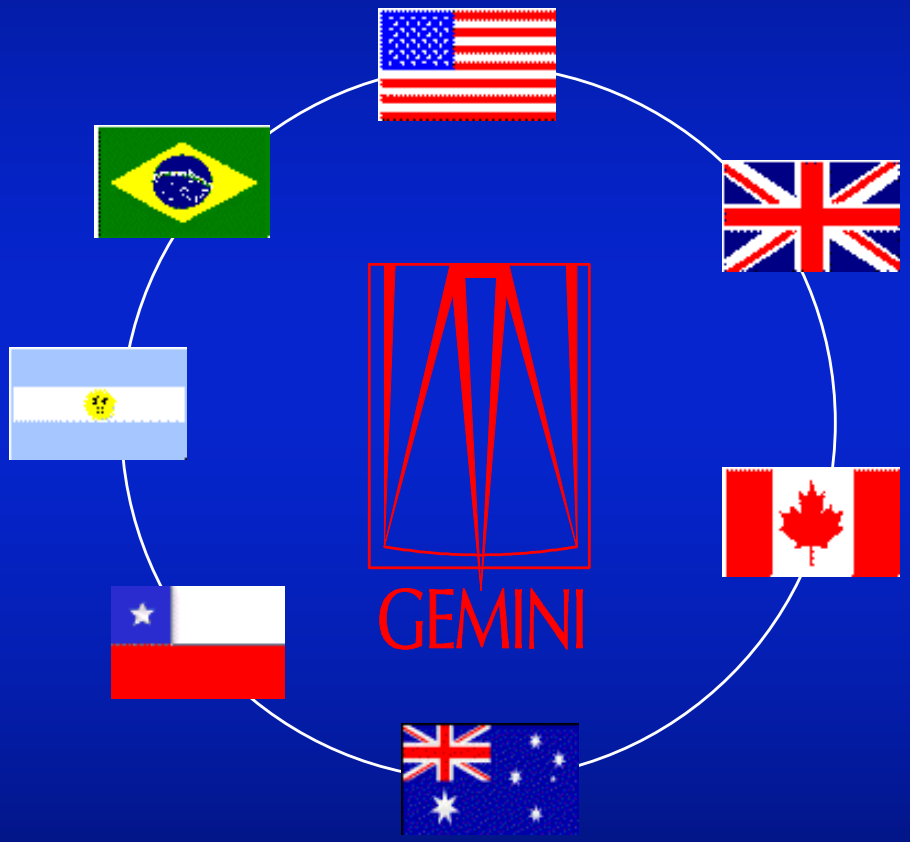

Gemini Observatory
Two 8 meters telescope 7000
miles away

Like most of current and future large astronomical projects.

Is an International Partnership



Partner shares

- US (NSF) + UH 51.4 %
- UK 22.9 %
- Canada 12.9 %
- Australia 4.6 %
- Chile (Host) 3.6 %
- Argentina 2.3 %
- Brazil 2.3 %

Why an International Partnership?

- Collaboration combines the best talents.
- Big telescopes are expensive for one country.
- Instrumentation for telescopes require high technology and new developments.
- Operation cost is higher for telescope to far away

(MOSTLY... Big Telescopes, Instruments, and Ops Just Cost Too Much)

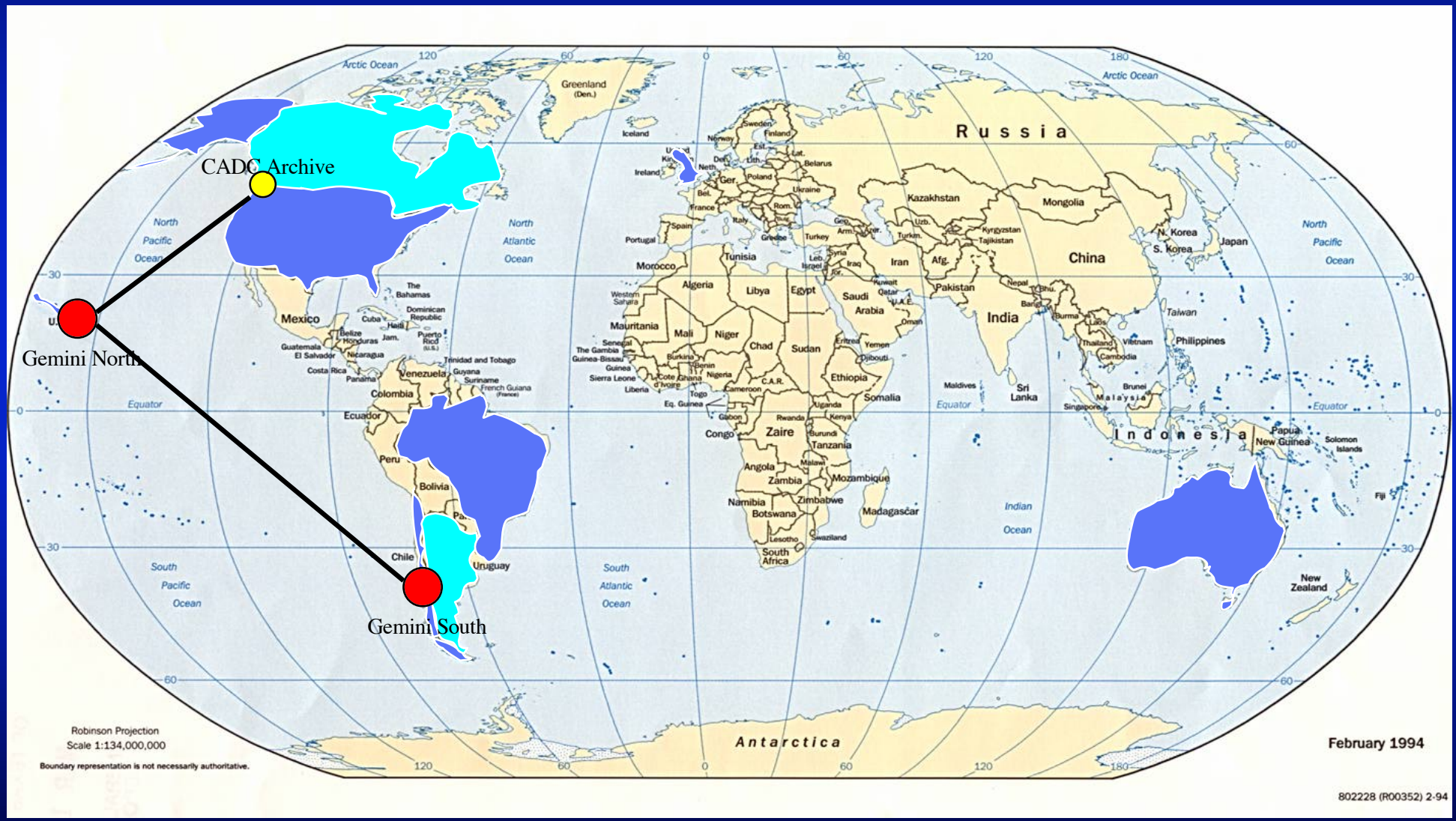
US Astronomy Interests Inexorably Tied to International Programs

Data transfer from the telescope (NGC1068)

- From the current example
  - Raw images 60 Mbytes each one
    - 3 colors
    - 5 exposure for filters
    - 19 calibration images (bias level + flat fields)
    - Another 9 images for the flux calibration to get scientific results (standards)
  - Total 3 x 5 + 19 + 9 = 43 images or 2.5 Gbytes
  - Data that need to be send to the PI as well to the archiving center

Primary Operational Links

(Logical Topography)



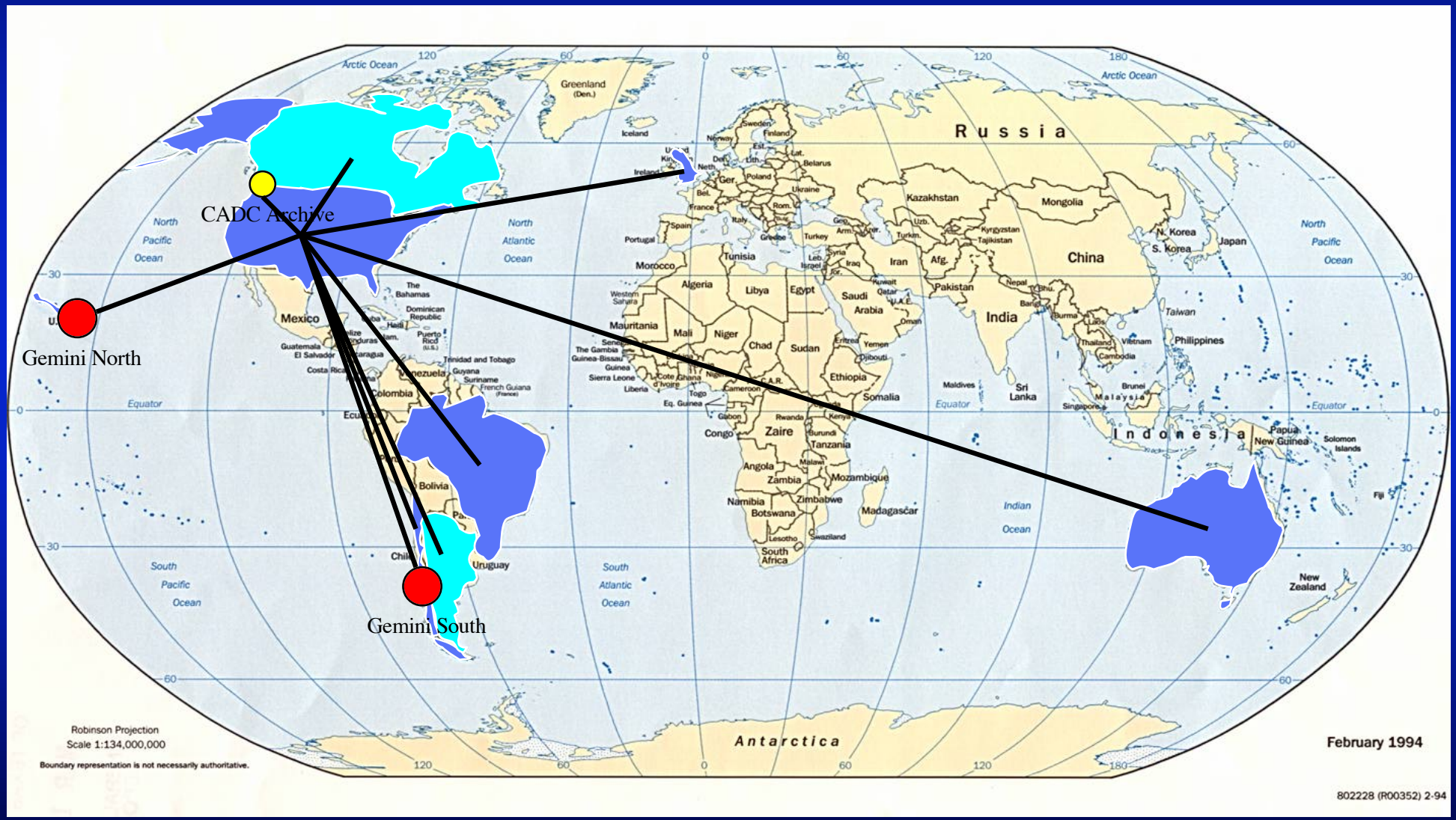
Gemini data archiving and access

- Easy access and use
- Archive raw data
- Online storage science data
- Online science catalogue of archive data
- Mirror capabilities in partner countries
- Cross referencing to other archives
- Data mining capabilities

…broad band link guaranteed

Primary Research Links

(Logical, But Somewhat More Literal Topography)



Current Status

- Big Island Observatories to Abilene – On Line
  - 45 Mbps
  - NSF Start-up Grants to Gemini and U. Hawaii
- Chile Summits to Base Facilities – On Line
  - 155 Mbps Two-Hop Microwave (Serves Gemini, CTIO, and SOAR)
  - NSF Grant to Gemini and CTIO
- Chile Base Facilities to Abilene – (April 15th)
  - 10 Mbps to AMPATH (Serves Gemini, CTIO and SOAR)
  - NSF AST Grant to Gemini

Internet2 to Gemini South and Collaborators

- Gemini/CTIO Facilities La Serena to
- Entel POP La Serena to
- Entel (Global Crossing) POP Santiago to
- AMPATH POP Miami (FIU) to
- Abeline POP Atlanta to
- Abeline POP Seattle to
- University of Hawaii to
- Gemini Facilities Hilo

Closing Comments & Concerns

- AMPATH is critical to US Gemini Science
  - One of the telescope is located in South America
  - 3 of 7 partnership countries are in South America
- AMPATH is also critical for the observatory operation
  - For remote telescope access to/from US
  - For remote operation too.
- AMPATH also need to guarantee
  - Secure access
  - Scalable bandwidth for the future applications and needs.
- NSF Start-Up Help to Bridge "Budget-Year Gap"
  - Very Effective Recently in Hawaii and Chile (THANKS!)